

What is Claimed Is:

1. A wheel-lift assembly for wreckers for towing a target automobile, the assembly comprising:

a crossbar assembly;

a pair of support arms, each of said support arms being pivotally associated with the crossbar assembly at a predefined point, the support arms being spaced apart from each other, and defining an inbound portion of the crossbar assembly between the predefined points and an outbound portion of the crossbar assembly outside of the predefined points; and

a pair of actuating devices connected to said outbound portion of said crossbar assembly, respectively, each of said actuating devices being operatively connected to one of said support arms.

2. The wheel-lift assembly of claim 1, further comprising a pair of over-center locking mechanisms, each connected to said crossbar assembly, to one of the actuating devices, and to one of said support arms.

3. The wheel-lift assembly of claim 1, wherein each support arm comprises a substantially L-shaped lifting arm having an extension arm segment and an engaging arm segment, said extension arm segment adjustably connected to a respective support arm, each of said engaging arm segments being substantially transverse to the extension arm segment.

4. The wheel-lift assembly of claim 3, wherein the extension arm segments are slidably connected to the respective support arms.

5. The wheel-lift assembly of claim 1, wherein the crossbar assembly comprises a crossbar and a pair of opposed grid boxes fixedly mounted to the crossbar;  
wherein the support arms are pivotally attached to the grid boxes; and  
wherein each of the over-center locking devices is disposed within one of the grid boxes.

6. The wheel-lift assembly of claim 2, wherein each of the over-center locking devices comprises a first and a second link, a first end of the first link being pivotally connected to a first end of the second link, a second end of the first link being pivotally connected to the crossbar assembly, and a second end of the second link being pivotally connected to one of the support arms, and

wherein one of the actuating devices is pivotally connected between the first and second ends of one of the links.

7. The wheel-lift assembly of claim 5, wherein each of the overcenter locking devices comprises a first and a second link, a first end of the first link being pivotally connected to a first end of the second link, a second end of the first link being pivotally connected to one of the grid boxes, and a second end of the second link being pivotally connected to one of the support arms, and

wherein one of the actuating devices is pivotally connected between the first and second ends of one of the links.

8. The wheel-lift assembly of claim 1, wherein the pair of actuating devices comprise a pair of hydraulic cylinders.

9. The wheel-lift assembly of claim 1, wherein said crossbar assembly includes a pivot for mounting the target automobile on the wheel-lift assembly when the length of said target automobile is at an angle of about zero degrees to about ninety degrees from the length of said wrecker.

10. The wheel-lift assembly of claim 1, wherein the crossbar assembly comprises a crossbar and a pair of opposed grid boxes, each mounted in to the crossbar in the outbound portion of the crossbar assembly;

wherein each of the grid boxes substantially fully encloses each of the actuating devices.

11. The wheel-lift assembly of claim 10, further comprising a pair of over-center locking mechanisms, each connected to said crossbar assembly, to one of the actuating devices, and to one of said support arms, wherein each of the grid boxes substantially fully encloses each of the over-center locking mechanisms.

12. The wheel-lift assembly of claim 1, comprising an adjustable tow vehicle body sub-frame assembly for mounting on one of a plurality of tow vehicle chassis having different widths, the adjustable body sub-frame assembly including:

left and right sub-frame rails that mount on left and right chassis rails between the outer rear wheels, respectively, each sub-frame rail having at least a first engaging sub-frame element fixed thereto in a lateral direction to the respective chassis rail, and each sub-frame rail having at least one body support element fixed thereto in a lateral direction the respective chassis rail;

a second engaging sub-frame element having two connecting ends, the second sub-frame

element connecting to the first sub-frame element of the left sub-frame rail at one connecting end, and connecting the first sub-frame element of the right sub-frame rail to the other connecting end; and

the first sub-frame brace elements being connected at a predetermined distance to the second sub-frame brace element at a position such that each sub-frame rail aligns with the respective chassis rail, and the first sub-frame brace element secured to the second sub-frame brace element at that predetermined position.

13. The wheel-lift assembly of claim 12, including an adjustable body panel comprising:

at least one mounting element fixed to the body panel extending laterally to the body panel, and the one mounting element having spacing along its length;

the one mounting element aligning with the corresponding body support element fixed to the predetermined tow vehicle chassis, the one body support element extending laterally to the chassis, and having spacing along its length; and

the body panel being mountable on the one body support element in one of a plurality of lateral positions, wherein in each such position the spacing of the one mounting element mate with the spacing of the body support element at one of a plurality of positions relative to said widths of the tow vehicle chassis rails.

14. The wheel-lift assembly of claim 1, wherein the pair of support arms each have a first distal end and a second distal end, further comprising reinforcing steel secured proximate to

one of the first distal end and the second distal end of each arm creating wear zone on the support arm corresponding to an area not reinforced by the reinforcing steel.

15. The wheel-lift assembly of claim 14, wherein the reinforcing steel segments are secured proximate to both the first distal end and the second distal end of each arm creating.

16. The wheel-lift assembly of claim 14, wherein the reinforcing steel segments are secured to at least one side of the support arm.

17. The wheel-lift assembly of claim 14, wherein the reinforcing steel reinforces a corresponding reinforcement area to a strength greater than that of the wear zone.

18. The wheel-lift assembly of claim 17, wherein the strength of the wear zone is at least 100ksi.

19. A wheel-lift assembly for wreckers for towing a target automobile, the assembly comprising:

a crossbar assembly;

a pair of support arms, each of said support arms being pivotally associated with the crossbar assembly and having a first distal end and a second distal end; and

reinforcing steel secured proximate to at least one of the first distal end and the second distal end of each arm creating wear zone on the support arm corresponding to an area not reinforced by the reinforcing steel.

20. The wheel-lift assembly of claim 19, wherein the reinforcing steel segments are secured proximate to both the first distal end and the second distal end of each arm creating.

21. The wheel-lift assembly of claim 19, wherein the reinforcing steel segments are secured to at least one side of the support arm.

22. The wheel-lift assembly of claim 19, wherein the reinforcing steel reinforces a corresponding reinforcement area to a strength greater than that of the wear zone.

23. The wheel-lift assembly of claim 22, wherein the strength of the wear zone is at least 100ksi.

24. The wheel-lift assembly of claim 19, comprising an adjustable tow vehicle body sub-frame assembly for mounting on one of a plurality of tow vehicle chassis having different widths, the adjustable body sub-frame assembly including:

left and right sub-frame rails that mount on left and right chassis rails between the outer rear wheels, respectively, each sub-frame rail having at least a first engaging sub-frame element fixed thereto in a lateral direction to the respective chassis rail, and each sub-frame rail having at least one body support element fixed thereto in a lateral direction the respective chassis rail;

a second engaging sub-frame element having two connecting ends, the second sub-frame element connecting to the first sub-frame element of the left sub-frame rail at one connecting end, and connecting the first sub-frame element of the right sub-frame rail to the other connecting end; and

the first sub-frame brace elements being connected at a predetermined distance to the second sub-frame brace element at a position such that each sub-frame rail aligns with the respective chassis rail, and the first sub-frame brace element secured to the second sub-frame brace element at that predetermined position.

25. The wheel-lift assembly of claim 24, including an adjustable body panel comprising:

at least one mounting element fixed to the body panel extending laterally to the body panel, and the one mounting element having spacing along its length;

the one mounting element aligning with the corresponding body support element fixed to the predetermined tow vehicle chassis, the one body support element extending laterally to the chassis, and having spacing along its length; and

the body panel being mountable on the one body support element in one of a plurality of lateral positions, wherein in each such position the spacing of the one mounting element mate with the spacing of the body support element at one of a plurality of positions relative to said widths of the tow vehicle chassis rails.

26. A wheel-lift assembly for wreckers, the assembly comprising:

a crossbar assembly comprising a crossbar and a pair of opposed grid boxes mounted to the crossbar on an outbound portion of the crossbar;

a pair of support arms, each of said support arms being pivotally attached to one of the grid boxes, the support arms being spaced apart from each other;

a pair of actuating devices, each of said actuating devices being fixed relative to the outbound portion of the crossbar and fully enclosed in the grid boxes;

a pair of over-center locking mechanisms, each connected to one of the grid boxes, to one of the actuating devices, and to one of said support arms; and

reinforcing steel secured proximate to at least one of the first distal end and the second distal end of each support arm creating wear zone on the support arm corresponding to an area not reinforced by the reinforcing steel.

27. A wrecker for towing a vehicle, the wrecker comprising a tow vehicle chassis, a wheel-lift assembly, an adjustable body sub-frame assembly mounted thereon, and an adjustable body panel assembly;

the wheel-lift assembly comprising:

a crossbar assembly;

a pair of support arms, each of said support arms being pivotally associated with the crossbar assembly at a predefined point, the support arms being spaced apart from each other, and defining an inbound portion of the crossbar assembly between the predefined points and an outbound portion of the crossbar assembly outside of the predefined points; and

a pair of actuating devices connected to said outbound portion of said crossbar assembly, respectively, each of said actuating devices being operatively connected to one of said support arms.

28. A wrecker for towing a vehicle, the wrecker comprising a tow vehicle chassis, a wheel-lift assembly, an adjustable body sub-frame assembly mounted thereon, and an adjustable body panel assembly;

the wheel-lift assembly comprising:

a crossbar assembly;



a pair of support arms, each of said support arms being pivotally associated with the crossbar assembly and having a first distal end and a second distal end; and

reinforcing steel secured proximate to at least one of the first distal end and the second distal end of each arm creating wear zone on the support arm corresponding to an area not reinforced by the reinforcing steel.